



# STEFFES

## Heating Systems

*"Manufactured in North America"*

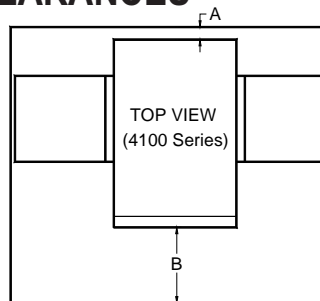
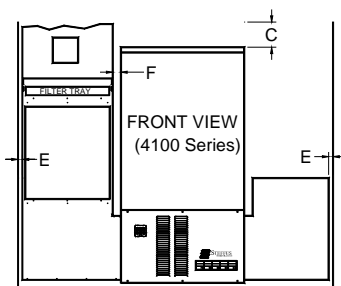
### COMFORT PLUS

### Models 4120, 4130, 4140

with ECM Variable Speed  
Blower System

## Quick Reference Installation Guide

### 1 PLACEMENT AND CLEARANCES



#### **WARNING**

The area in which the Comfort Plus is installed must remain free of debris and room air should be maintained at less than 85°F.

- A Back and Sides = 3 inches from combustibles
- B Front = 36 inches
- C Top = 6 inches from combustibles
- D Bottom = zero clearance
- E Outer Sides of Return and Supply Ducts = zero clearance
- F Between Duct and Left Side = 2 inches

### 2 SET-UP

1. Remove heating elements from base.
2. Place system in desired location.
3. Adjust leveling legs to prevent rocking.
4. Remove painted front panel of brick storage cabinet.
5. Position element wiring harnesses to avoid damage during brick loading.
6. Disconnect brick core temperature sensor(s) from shipping position. Position sensor(s) to avoid damage during brick loading.
7. Remove galvanized front panel.
8. Starting at bottom, lift and drape insulation blankets over top of system.
9. Remove front air channel by pulling out at top.
10. Remove electrical panel cover and locate element screw kit and outdoor sensor.

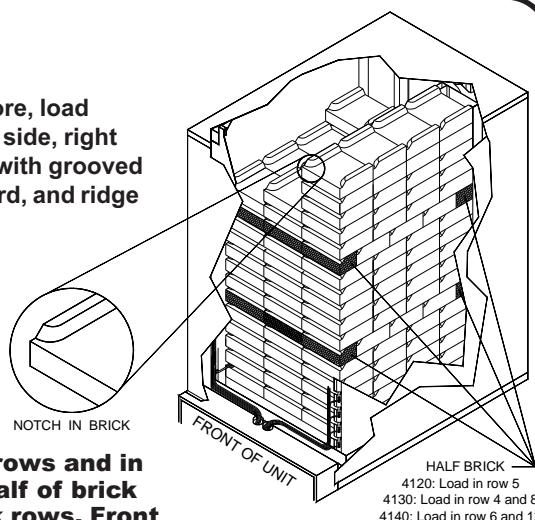
#### **WARNING**

- **DO** remove the Comfort Plus system from its shipping pallet before installing.
- **DO NOT** extend leveling legs more than one inch.
- **DO** use and follow generally accepted safety practices when handling insulation material.
- **DO** have equipment installed by a qualified technician in compliance with all applicable local, state and national codes and regulations.
- **Reference Owner's and Installer's Manual for complete safety, installation, and operation instructions.**

### 3 BRICK LOADING

Starting at the back of the brick core, load bricks one row at a time using left side, right side, center pattern. Place bricks with grooved side facing up, notch facing forward, and ridge on left and right.

- Remove loose brick debris from brick.
- Brick rows **MUST** line up front to back and side to side.
- Use half bricks in proper rows and in correct positions. Back half of brick **MUST** be installed in back rows. Front half (notched brick piece) **MUST** be installed in front rows.

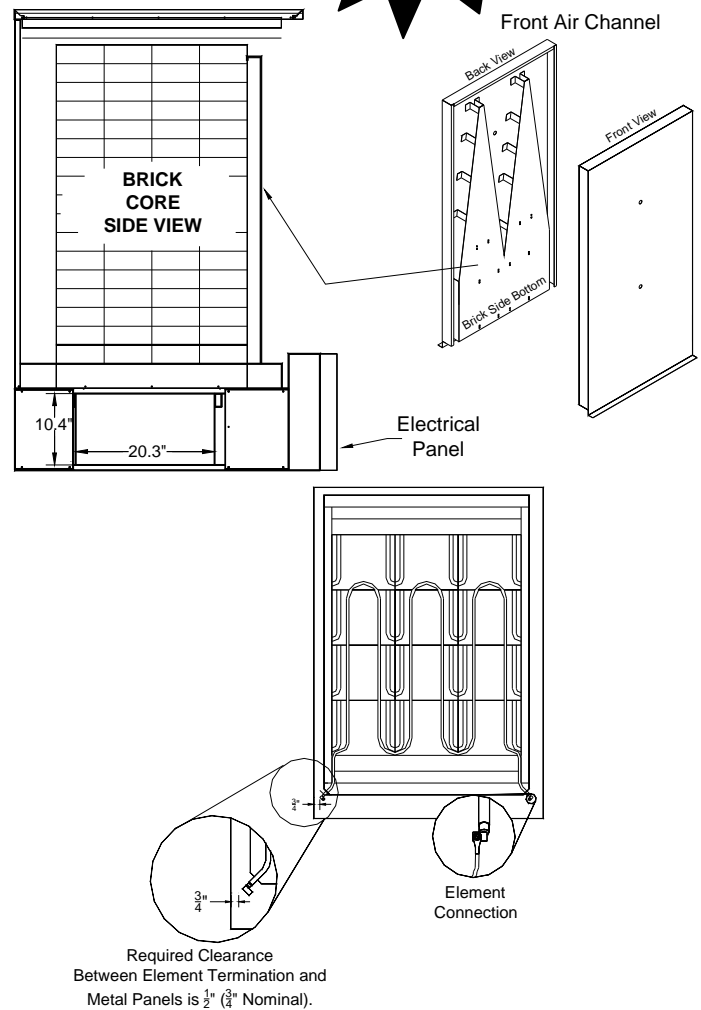


## 4 HEATING ELEMENT AND AIR CHANNEL INSTALLATION

### WARNING

**HAZARDOUS VOLTAGE:** Risk of electric shock. Can cause injury or death.

- **DO NOT** remove electrical panel cover while system is energized.
  - Elements **MUST** be positioned properly to avoid short circuiting them against any surfaces within system.
  - Use care when making connections to avoid element damage.
1. Insert heating elements between brick layers until element ends embed into side cutouts of brick cavity. Elements **MUST** be installed with threaded screw tabs on wire connection terminals pointing forward and down.
  2. Install front air channel with air deflectors (arrow shaped pieces) facing inward and narrow ends of deflectors pointing up. Place top of air channel in first.
  3. Lower insulation blankets back into position, one at a time. Tuck sides into edges, corners and around exposed portions of heating elements.
  4. Install galvanized panel. Slide the top inside the upper lip of top painted panel. Bottom rests on the outside of the brick cavity.
  5. Connect wiring harnesses to heating elements using screws in element screw kit. Install screws with heads up and threads pointing down. Tighten screws to 14 in lbs.
  6. Check non-insulated element connections to make sure they do not come within 1/2" of any surface.



## 5 BRICK CORE TEMPERATURE SENSOR(S) INSTALLATION

### WARNING

**Risk of improper operation. Proper installation of the brick core temperature sensor(s) is critical to the operation of the Comfort Plus heating system. Read and follow installation instructions carefully.**

1. Remove screw(s) by temperature sensor hole(s) in galvanized front panel.
2. Insert temperature sensor(s) through hole(s). Sensor(s) must pass through blanket insulation and into brick core.
3. Install screw(s) into galvanized front panel to hold sensor(s) and provide electrical ground connection.
4. Inspect sensor wiring for possible short circuiting hazards.
5. Install painted front panel.

**NOTE:** Models 4130 and 4140 have an upper and a lower temperature sensor. The upper core sensor **MUST** be installed in the upper core for proper operation.

## 6 AIR CONDITIONER/HEAT PUMP INTERFACE

When interfacing a heat pump with the Comfort Plus, the A-coil **MUST** be placed in the return air plenum.

### WARNING

**Risk of fire. Any one ducting system MUST NOT contain more than one air handling (blower) system.**

The Comfort Plus system can accommodate most heat pump or air conditioner indoor coils provided the heat pump or air conditioner is sized in accordance to supply air delivery rates of the Comfort Plus.

- 1/2 HP variable speed accommodates most 1.5 to 4 ton heating/cooling systems
- 1 HP variable speed accommodates most 3 to 5 ton heating/cooling systems

## 7 DUCTING

4100 Series systems are factory configured for a left-to-right or right-to-left airflow. For a down flow configuration, order Down Flow Kit #1301578.

1. Unbox supply air blower plenum assembly.
2. Remove and discard metal plate securing supply air blower to plenum assembly.
3. Attach plenum support bracket to supply air side using blunt tip screws.
4. Attach supply blower wiring harness to blower. Place excess wiring in base below radiant heat shield.
5. Verify blower is installed with motor facing away from system.
6. Attach supply air blower plenum. Drill two 1/8" holes per edge. Use self-tapping screws.
7. Connect return air and supply air ducting. The air holes directly above the air outlet on the right side **MUST** be contained in the duct system.
8. If necessary, adjust supply air blower speed by using the chart below.
9. The W/E jumper **MUST** be in the ON position or the blower will not operate with an E call from the thermostat.

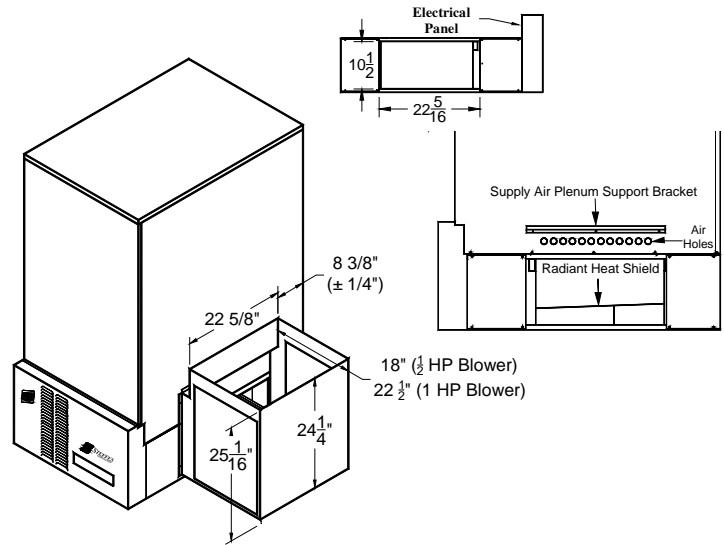
Jumper	1/2 HP Variable Speed CFM	1 HP Variable Speed CFM
A	1000	1200
B	1200	1400
C	1400	1600
D	1600	2000

External static pressure should not exceed .75" water column.



## ⚠ WARNING

**HAZARDOUS VOLTAGE: Risk of electric shock. Can cause injury or death. DO NOT operate the Comfort Plus heating system without ducting installed to both the air inlet and outlet.**



- When interfacing with a heat pump, the A-Coil **MUST** be placed on the return air side.
- To maintain a room temperature of 85°F or less in the mechanical room, a 24" x 24" opening can be installed in the area or a 6" x 6" non-closing register can be cut into the return air duct. Refer to Placement and Clearance Requirements section of Owner's and Installer's Manual for more information.

## 8 LINE VOLTAGE ELECTRICAL CONNECTIONS

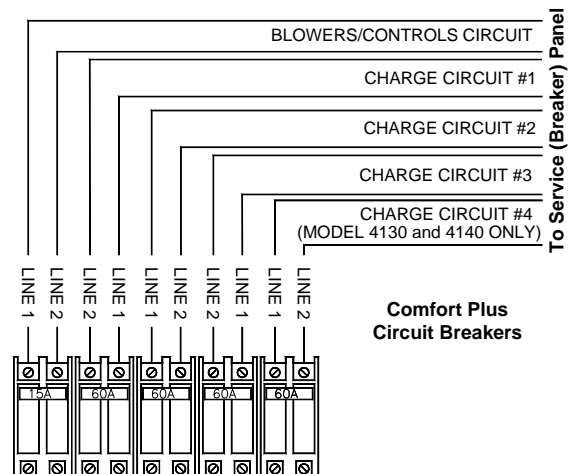
### ⚠ WARNING

**HAZARDOUS VOLTAGE: Risk of electric shock. Can cause injury or death. Do not energize the Comfort Plus heating system until installation is complete.**

1. Route all line voltage wires through knockout(s) and into electrical panel.
2. Make proper field wiring connections phasing circuits as shown on the left. Reference the Unit Identification Label for circuit information.

- To ensure proper operation and safety, all line voltage circuits must be segregated from low voltage wiring.
- To reduce electromagnetic fields associated with electrical circuits and to avoid induced voltage on sensors and electronic devices, the circuit phases **MUST** be alternated as shown on the left.
- **DO NOT** install any wiring in the line voltage compartment of the Comfort Plus heating system unless it is rated for line voltage.

### CIRCUIT PHASING CONNECTIONS



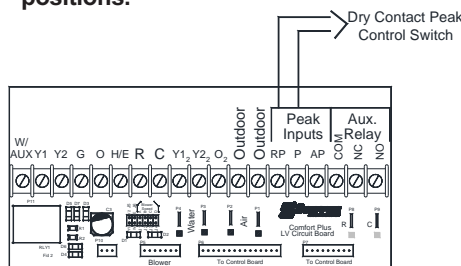
### Full Load Current

Show n for 240VAC only. Circuit deration not included.

Model	Control Crct	Chrg Crct #1	Chrg Crct #2	Chrg Crct #3	Chrg Crct #4
4120 - 14.0kW	7.00	21.88	21.88	14.58	N/A
4120 - 19.2kW	7.00	30.00	30.00	20.00	N/A
4120 - 24.8kW	7.00	38.75	38.75	25.83	N/A
4130 - 28.8kW	7.00	30.00	30.00	30.00	30.00
4130 - 37.2kW	7.00	38.75	38.75	38.75	38.75
4140 - 38.4kW	7.00	40.00	40.00	40.00	40.00
4140 - 45.6kW	7.00	47.50	47.50	47.50	47.50

## 9 LOW VOLTAGE PEAK CONTROL CONNECTIONS

1. Route low voltage wire from load control device to terminal block.
2. Connect field wiring to "RP" and "P" positions.



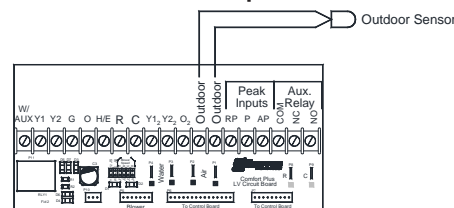
If utilizing a Steffes Time Clock Module or Power Line Carrier control, refer to the installation instructions provided with the device.

## 10 LOW VOLTAGE OUTDOOR SENSOR CONNECTIONS

The outdoor temperature sensor can be installed by wiring it directly to the system or to the Steffes power line carrier (PLC) system.

**Direct Wired:**

1. Mount outdoor sensor in a location where it can accurately sense outdoor temperature.
2. Route low voltage wire from outdoor sensor to electrical compartment:
  - Outdoor sensor wire **MUST NOT** be combined with other control wiring in a multi-conductor cable.
  - Seal external wall openings.
  - Outdoor sensor lead can be extended to 250 ft.
  - Unshielded Class II (thermostat) wire can be used provided it is segregated from any line voltage wiring.
3. Connect outdoor sensor wires to the two "OUTDOOR" positions of the low voltage terminal block.



If connecting to the Steffes power line carrier system, follow the installation instructions in the PLC system's Owner's and Installer's Guide.

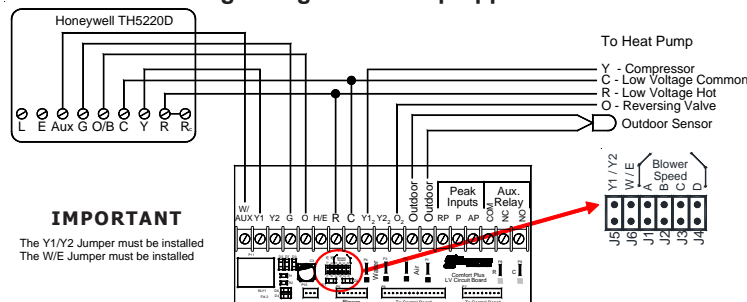
## 11 LOW VOLTAGE ROOM THERMOSTAT CONNECTIONS

A 24 VAC thermostat must be used (digital recommended).

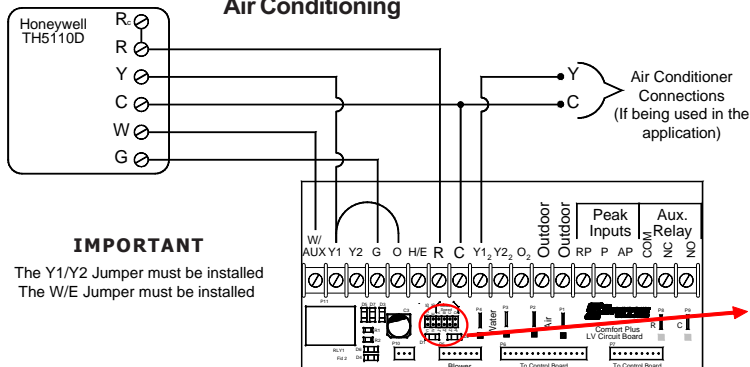
1. Disconnect power to the Comfort Plus system.
2. Route low voltage wires from the thermostat to the Comfort Plus System.
3. Insulate thermostat wire wall opening if necessary and attach thermostat to the wall. When using a mechanical thermostat or thermostat with anticipator, resistor kit #1190015 must be installed to ensure proper operation.
4. Connect low voltage wires from thermostat into terminal block as shown.

**NOTE:** For detailed heat call information, reference the Owner's and Installer's Manual!

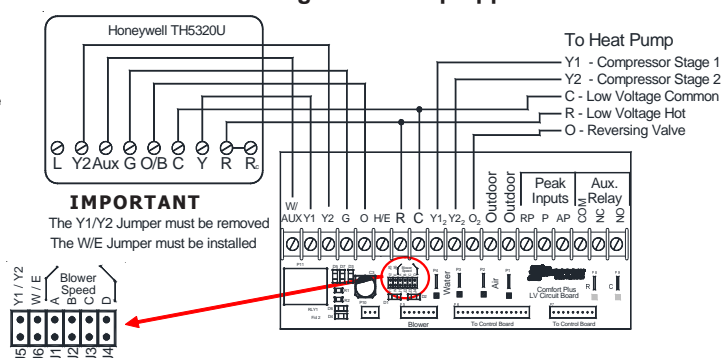
### Single Stage Heat Pump Application



### Stand Alone Furnace Application with Uncontrolled Air Conditioning



### Two Stage Heat Pump Application



## 12 SOFTWARE CONFIGURATION AND INSTALLERS FINAL CHECKOUT

To ensure proper operation, the system software must be configured for the application. Refer to the Configuration Menu in the Owner's and Installer's Manual or to the Configuration Guide provided by your local power company. Also, complete the Installer's Final Checkout Procedure found in the Owner's and Installer's Manual.